

What Is Claimed Is:

1. A method of forming a molded fibrous construct, comprising the steps of:

- a) forming a fibrous batt from staple length fibers
comprised at least in part of thermoplastic polymer,
- b) mechanically integrating the fibrous batt into a fibrous pre-form mat,
- c) thermally treating the fibrous pre-form at a first elevated temperature for an initial duration,
- d) cooling the fibrous pre-form to less than the first elevated temperature, and
- e) thermoforming the thermally treated fibrous pre-form into a molded construct.

2. A method of forming a molded fibrous construct as in claim 1, wherein said staple length fibers are selected from the group consisting of natural fibers, synthetic fibers, and the blends thereof.

3. A method of forming a molded fibrous construct as in claim 2, wherein said staple length synthetic fibers are selected from a group consisting of polyacrylates, polyolefins, polyesters, and polyamides.

4. A method of forming a molded fibrous construct as in claim 2, wherein said staple length fibers are selected from a group consisting of cotton, wood pulp, rayon, and the combinations thereof.

5. A method of forming a molded fibrous construct as in claim 1, wherein said staple length thermoplastic fibers have a denier of at least 1.0.

6. A method of forming a molded construct as in claim 1, wherein said fibrous batt has a binder fiber composition of at least 50% by weight.

7. A method of forming a molded fibrous construct, comprising the steps of;

- a) forming a fibrous batt from staple length fibers
comprised at least in part of thermoplastic polymer,

b) mechanically integrating the fibrous batt into a fibrous pre-form mat,

c) thermally treating the fibrous pre-form at a first elevated temperature for an initial duration,

5 d) compressing the heated fibrous pre-form to a level less than an uncompressed fibrous pre-form and greater than the part depth a molded fibrous construct is to have,

e) cooling the fibrous pre-form to less than the first elevated temperature,

10 f) thermoforming the thermally treated fibrous pre-form into a molded construct.

8. A method of forming a molded fibrous construct, comprising the steps of;

15 a) forming a fibrous batt from staple length fibers comprised at least in part of thermoplastic polymer,

b) mechanically integrating the fibrous batt into a fibrous pre-form mat,

c) thermally treating the fibrous pre-form at a first elevated temperature for an initial duration,

20 d) compressing the heated fibrous pre-form to a level equal to the part depth a molded fibrous construct is to have,

e) cooling the fibrous pre-form to less than the first elevated temperature,

25 f) thermoforming the thermally treated fibrous pre-form into a molded construct.

9. A method of forming a molded fibrous compound construct, comprising the steps of;

a) forming a fibrous batt from staple length fibers comprised at least in part of thermoplastic polymer,

b) mechanically integrating the fibrous batt into a fibrous pre-form mat,

c) position at least one facing layer in face to face juxtaposition with the fibrous pre-form,

5 d) thermally treating the layered fibrous pre-form at a first elevated temperature for an initial duration,

e) cooling the layered fibrous pre-form to less than the first elevated temperature, and

10 f) thermoforming the thermally treated layered fibrous pre-form into a molded compound construct.

10. A method of forming a molded fibrous compound construct, comprising the steps of;

a) forming a fibrous batt from staple length fibers comprised at least in part of thermoplastic polymer,

15 b) mechanically integrating the fibrous batt into a fibrous pre-form mat,

c) position at least one facing layer in face to face juxtaposition with the fibrous pre-form,

20 d) thermally treating the layered fibrous pre-form at a first elevated temperature for an initial duration,

e) compressing the heated layered fibrous pre-form to a level less than an uncompressed fibrous pre-form and greater than the part depth a molded fibrous construct is to have,

25 f) cooling the layered fibrous pre-form to less than the first elevated temperature,

g) thermoforming the thermally treated fibrous pre-form into a molded compound construct.

11. A method of forming a molded fibrous compound construct, comprising the steps of;

- a) forming a fibrous batt from staple length fibers
comprised at least in part of thermoplastic polymer,
- b) mechanically integrating the fibrous batt into a fibrous
pre-form mat,
- 5 c) position at least one facing layer in face to face
juxtaposition with the fibrous pre-form,
- d) thermally treating the layered fibrous pre-form at a first
elevated temperature for an initial duration,
- e) compressing the heated layered fibrous pre-form to a
10 level equal to the part depth a molded fibrous construct is to have,
- f) cooling the layered fibrous pre-form to less than the first
elevated temperature,
- g) thermoforming the thermally treated layered fibrous pre-
form into a molded compound construct.

15 12. A molded construct comprising,

- a) a fibrous mat comprised at least in part of thermoplastic
polymer,
- b) said thermoplastic polymer comprised of at least one heat
activated binder component,
- 20 c) said fibrous mat having been heated to the activation
temperature of the binder component, then cooled to a temperature less
than the activation temperature of the binder component.

13. A molded construct comprising a fibrous batt integrated into a
fibrous pre-form mat, wherein:

25 said fibrous pre-form is subjected to an elevated temperature,
compressed to a depth less than the uncompressed fibrous pre-form and
greater than the part depth of the molded construct, cooled, and
thermoformed.

30 14. A molded construct comprising a fibrous batt integrated into a
fibrous pre-form mat, wherein:

said fibrous pre-form is subjected to an elevated temperature, compressed to a level equal to the part depth of the molded construct, cooled and thermoformed.

5 15. A molded construct comprising a fibrous batt integrated into a fibrous pre-form mat, wherein:

said fibrous perform comprises at least one facing layer, subjected to an elevated temperature, cooled, and thermoformed.

10 16. A molded construct comprising a fibrous batt integrated into a fibrous pre-form mat, wherein:

said fibrous perform comprises at least one facing layer, subjected to an elevated temperature, compressed to a level less than an uncompressed fibrous pre-form and greater than the part depth of the molded construct, cooled, and thermoformed.

15 17. A molded construct comprising a fibrous batt integrated into a fibrous pre-form mat, wherein:

said fibrous perform comprises at least one facing layer, subjected to an elevated temperature, compressed to a level equal to the part depth of the molded construct, cooled, and thermoformed.

20 18. A molded construct comprising a fibrous batt, which is integrated into a fibrous pre-form mat, having a stiffness performance of at least 15% greater than a molded construct devoid of a fibrous pre-form.

19. A molded construct as in claim 7, wherein said molded construct is an automotive interior panel.

25 20. A molded construct as in claim 7, wherein said molded construct is an appliance facing.

21. A molded construct as in claim 7, wherein said molded construct is an acoustic dampening shield.

22. A molded construct as in claim 7, wherein said molded construct is a domestic furnishing.

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